the coiled masses of the tentacles and polypites of *Physalia*, isopod crustaceans from about half to three-quarters of an inch in length, of a similar species to some I also occasionally obtained adherent to the floats of *Ianthina*, or floating epiphytic Lepadidæ of the open ocean. It is further deserving of notice that both fishes and isopod crustaceans invariably presented the brilliant blue markings visible on the tentacles and polypite masses of *Physalia*—and, lastly, that, on placing specimens of *Physalia* on a piece of cardboard immediately after capture, I have seen a slow rolling movement of the pneumatophore continue to take place for upwards of an hour, and, indeed, until its wall had actually shrivelled with the heat. The slow and rolling nature of this action gave me the distinct impression, at the time, that it was due to vital (probably muscular) contractility, and not merely mechanical.

III.—*Description of some new Species of Fossil Ferns from the Bournemouth Leaf-bed.* By A. Wanklyn, B.A., Sidney Sussex College, Cambridge.

[Plate I.]

In the spring of 1867, Admiral Sulivan was kind enough to show me some specimens of ferns which he had obtained from the Bournemouth leaf-bed. Since then I have endeavoured to obtain sufficient data for the determination of these ferns. This I have done with regard to the ferns most commonly found, which I now propose to figure and describe.

I also figure two other ferns, which differ from these, but of which I have only been able to find the specimens from which the drawings are made.

Few patches of clay in this district are entirely without traces of leaves; their absence at any particular spot seems to be due, not so much to a scarcity of leaves when the strata were deposited as to the fact of the matrix having been unfavourable to their preservation.

The ferns, however, seem to be very local. I have only heard of their being found at one place in this district; and there they occur in great abundance. In the section exposed in 1867 there were two or three layers, each about an inch in thickness, which consisted of dicotyledonous leaves and fronds of ferns matted together. Beneath these there was usually a thin stratum of sand a few lines in thickness.

The state of preservation of the ferns varies with the nature of the deposit. Where the matrix is sandy, the carbonaceous matter has almost disappeared, and often only the cast of the

frond remains; where it is a close and compact clay, the impressions of the upper and lower epidermis are preserved, and owe their colour to the decomposition of the intervening tissues. The veins are represented by channels which often contain the remains of fibre. Their distinctness depends upon the relative decomposition of the tissues. Where the vegetable matter has been quickly and entirely removed, the specimens present only indistinct traces of the venation; if, on the other hand, the matrix is charged with carbonaceous matter, the veins are lost in the substance of the frond, and leave no traces on the impressions.

It seems probable that these beds were deposited in a shallow estuary. Large masses of wood are to be found in the cliffs so honeycombed by *Teredo* as to leave but the thinnest partitions between the tubes. In strata deposited under estuarine conditions, we cannot look for a continuous record of events, because, although the accumulation of the materials may have been the work of ages, yet their final arrangement may have been effected in a comparatively short space of time.

With the exception of the *Teredo*-borings, few traces of animal life are to be found. Remains of insects from the pipe-clay at Corfe have been figured in the 'Quarterly Journal of the Geological Society,' in a paper by Mr. Prestwich. I have lately obtained from Bournemouth a fragment of an insect, which Mr. Dallas has kindly undertaken to determine if possible.

The ferns of which I have obtained sufficiently good specimens for description are closely allied to the recent subgenus *Mertensia* of the genus *Gleichenia*.

Subgenus Mertensites (nobis).

Stipes repeatedly dichotomous (Pl. I. fig. 2), the ultimate branches bearing simply forked pinnæ (figs. 1 *b*, *c*). Veins somewhat prominent, venules free. Sori near the middle of the two exterior venules of each fasciculus (fig. 1 *g*). Capsules sessile, deciduous, arranged round a punctiform receptacle.

Mertensites hantoniensis (nobis). Pl. I. figs. 1 *a*–*g*.

Stipes rounded; ultimate branches with a pair of pinnæ; pinnæ lanceolate pinnatifid; segments linear-acute, quite entire. Capsules globose, longitudinally striated, eight to ten in number.

This is the fern of which I have obtained the greatest number of specimens. The largest in my collection are from 5 to 6 inches in length. It is difficult to arrive at the entire length

of the pinnæ, as it is not easy to separate them from the leaves, and I have not yet seen an entire specimen.

Mertensites crenata (nobis). Pl. I. fig. 3.

Segments of the pinnæ crenato-lobate and rather broader than those of *M. hantoniensis.*

This species is much rarer than the preceding. I have a specimen which indicates a pinna 4 inches broad. It seems to be altogether on a larger scale than *M. hantoniensis.*

Croziers and fragments of stipites belonging to one or other of these species have been found; the stipites would indicate a fern probably 4 to 5 feet in length.

I hope at some future time to obtain specimens which will enable me to determine the rarer forms, figs. 4 *a*, *b*, and 5. All that I can say of them is that fig. 4 seems to be allied to *Lindsæa* or *Adiantum*, and fig. 5 to some genus of *Cyatheæ.*

EXPLANATION OF PLATE I.

Fig. 1 *a.* Part of pinna of *M. hantoniensis*, showing the venation.
1 *b*, *c*, *d*, *e.* Ultimate branches, showing the habit of growth.
1 *f*, *g.* Fructification. (1 *g* is enlarged.)
Fig. 2. Stipes of *Mertensites* (reduced one-half).
Fig. 3. Part of pinna of *M. crenata.*
Figs. 4 *a*, *b. Adiantum*?
Fig. 5. *Cyatheæ*?

IV.—*Investigation of the Freshwater Crustacea of Belgium.* By Félix Plateau. (First Part.)*

The study of the little freshwater Crustacea, already carried so far by Müller, Jurine, and Straus, was resumed in 1837 by the English zoologist Baird, who extended the circle of our knowledge with regard to them, and set himself to describe the species (especially of the genus *Cypris*) which are met with in England.

I have made some investigations of the same kind in Belgium, which, wedged in between France, Holland, and Germany, has a fauna partaking of those of these three countries, and consequently very rich.

The present memoir, which is only the first part of my work, contains the results of my anatomical and physiological observations upon the genera *Gammarus*, *Lynceus*, and *Cypris*, as also a list of the species of these genera which are met with in Belgium. In this summary I shall leave this list unnoticed. I may state, however, that the number of species which it contains is distributed as follows:—three for the genus *Gammarus*,

* For this abstract, as also for a copy of the original memoir, from "Tome xxxiv. des Mémoires couronnés publiés par l'Académie de Belgique," we are indebted to the author.—W. F.